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Prenatal Experience and Pregnancy Outcome In Saskatchewan

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PRENATAL EXPERIENCE AND PREGNANCY OUTCOME

IN SASKATCHEWAN

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Prepared by:
C. Ann Kilcher
Graduate Student
Faculty of Education
University of Regina

In Conjunction with:
Lynn Harasym
Provincial Nutritionist
Saskatchewan Health

Joanne Havelock
Policy Research and Management Systems
Saskatchewan Health

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ABSTRACT

A survey of 1976 mothers was conducted in Saskatchewan during November 1980 to determine current infant feeding practices. The final sample included 1342 mothers, 68% of the sampled population. In addition to collecting information on infant feeding practices, data was also collected on prenatal classes, weight gain, and infant birthweight. Some factors were examined to evaluate their affect on infant birthweights, the index of pregnancy outcome. Information on prenatal classes was analyzed in an attempt to identify attendance percentages, some characteristics of attenders, the location of classes, and the inclusion of an infant nutrition component.

Approximately one-third (36.4%) of the women in the study sample attended prenatal classes for this pregnancy and the majority of them were first time attenders. Very few mothers (10.1%) attended prenatal classes more than once and a substantial percentage of mothers (37.6%) had never attended prenatal classes. More younger mothers, those having their first child, and those with higher levels of education attend prenatal classes. Also those living in larger communities or cities are more frequent attenders. Family income did not have an effect on attendance.

Prenatal classes were attended most frequently (76.0% of the time) at Public Health Offices and at libraries, hospitals, or other locations 24.0% of the time. The majority of the classes (77.0%) provided information on infant nutrition which was usually presented by a nurse, nutritionist, or dietitian.

The average weight gain of mothers in the study group was 28¼ pounds. The majority of mothers (60.4%) had weight gains within the recommended range, between 20 and 35 pounds, 12.9% gained less than 20 pounds, and 26.7% gained in excess of 35 pounds during pregnancy.

The average birthweight of infants in the study group was 3451 grams. Only 3.6% of infants were born with a birthweight below 2500 grams while 13.8% had birthweights between 2500 and 2999 grams. The majority of infants (82.6%) had a birthweight over 3000 grams.

Birthweight proved to be significantly ($p < .01$) related to mother's prenatal weight gain. The incidence of optimal birthweight increased directly

as prenatal weight gain increased. Place of residence was identified as a second factor significantly affecting infant birthweights. Twenty-five percent of infants born in small cities in Saskatchewan have birthweights less than 3000 grams. Other factors examined including family income level, prenatal class attendance, mother's age and education level, and parity had no significant effect on infant birthweights.

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CHAPTER I

INTRODUCTION

Many studies have been conducted to investigate the relationship between the prenatal experience and pregnancy outcome. As a result, a number of factors have been identified as contributing to the successful outcome of pregnancy.

Data collected in a recent Saskatchewan study on Infant Feeding Practices (Saskatchewan Department of Health, 1983) allows for the comparison of some factors in the prenatal experience to pregnancy outcome. The pregnancy experience factors considered in this report were prenatal class attendance, prenatal weight gain, family income level, mother's age and education level, place of residence, and parity. The index of pregnancy outcome used was infant birthweight. Thus this report presents the results of an examination of the effect of selected prenatal and demographic factors on infant birthweights.

The report is organized according to three major topics: prenatal class information, prenatal weight gain, and infant birthweights. Chapter II reviews some of the relevant literature related to the three major topics. In Chapter III a brief description of the methodology used in the collection and analysis of the data is provided.

The results are then presented and discussed in Chapter IV in three sections. The first section presents the prenatal class information collected including demographic data associated with attendance. In the next section the prenatal weight gain of the sample is discussed. Infant birthweights are reported in the third section and factors related to pregnancy outcome are examined. In each section of the fourth chapter, the recommendation or position statement on the topic is presented, then the results are reported and discussed.

A final chapter summarizes the report and makes recommendations for future health promotion and education efforts.

CHAPTER II

LITERATURE REVIEW

Introduction

In this chapter, some of the relevant literature is briefly reviewed in a topical fashion according to those specific aspects included in the report - prenatal classes, prenatal weight gain, and infant birthweight. Each section states the position or recommendation, the rationale on the topic, and reviews various studies.

Prenatal Classes

Position Statement

Prenatal classes are recognized as one way of preparing expectant parents for childbirth.

Rationale

These classes were introduced to educate mothers using exercises that would help them through labor as well as provide them with an appreciation of some of the health concerns basic to effective child rearing (Thordarson and Costanzo, 1976).

Related Studies

Some studies have been conducted in an attempt to relate prenatal preparation classes to birth outcome. Although the factors that have been investigated are multitudinous, the studies were reviewed as they related to the data obtained in the present study.

Family Income, Mother's Age and Education Level. Family income, mother's age, and mother's education level have been related to prenatal class attendance. Thordarson and Costanzo (1976) found that class attendance was lower among younger, poorer, and less well educated women. They reported that only 44% of mothers whose annual income was less than $6,000 attended classes compared with 57% of mothers in the $6-10,000 category and 81% of those in the $10,000 or more category. Similar results were observed

by Davis and Morrone (1962) who found a significant and positive relationship between the type of occupation of the father and mother's attendance at prenatal classes. There was an increase in class attendance at higher income levels and a corresponding decrease in attendance when the income was lower.

In regard to mother's age, Davis and Morrone (1962) noted there was a significant reduction in the percentage of mothers less than 20 years of age attending prenatal classes. A similar trend was also reported by Thordarson and Costanzo (1976) as they found only 37% of mothers 19 years of age or less attended classes compared with 69% of those 20-39 years of age and 100% of mothers over 40 years of age.

Mother's education level was also identified as a significant factor related to prenatal class attendance by both researchers. They found an increasing percentage of attendance with an increased education level (partial college, college, or graduate school) and a similar progressive decrease related to high school, partial high school, and junior high.

In summary, prenatal class attendance increased as the age of the mother increased, as the education of the mother increased, and as the income level increased. Thus women who might be conisdered to be in the greatest need of prenatal education did not receive the benefit of prenatal instruction.

Other Factors. Neither of the studies examined the effect of previous prenatal class attendance, place of residence, or parity on prenatal class attendance.

Prenatal Weight Gain

Position Statement

Saskatchewan Health recommends a weight gain between 20 and 35 pounds (9-16 kg) as a practical range for the majority of women during pregnancy (Saskatchewan Department of Health, 1981).

Rationale

An adequate energy intake during pregnancy is critical for support of growth and development of the fetus and for the maternal ability to adapt to stresses related to pregnancy, such as infection or episodes of bleeding. Needs for additional energy are related to (1) the deposition of fetal and maternal tissues, (2) the additional metabolism the new tissue incur, and (3) the increased energy required to move the additional body mass when engaging

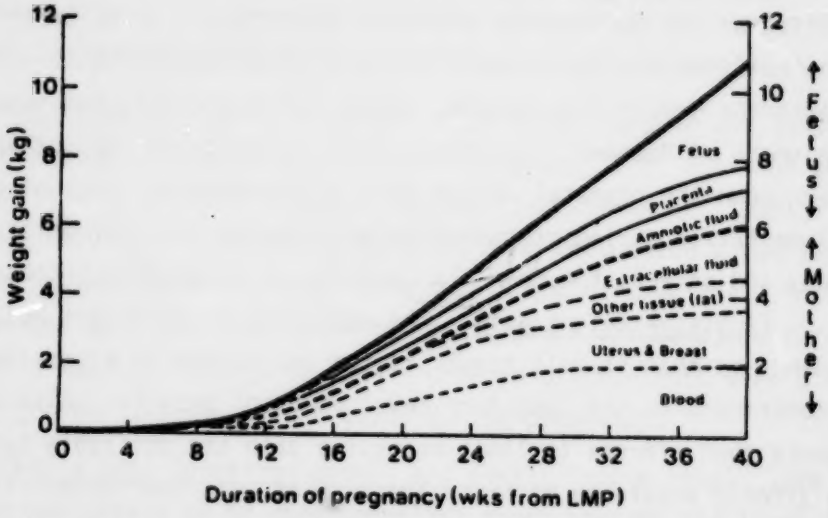
in physical activity (Jacobson, 1975).

Related Studies

The question of optimal weight gain has been the subject of a great deal of speculation. Current recommendations have been arrived at as a result of studies employing different approaches to define desirable weight gain.

Components of Weight Gain. One approach to the determination of desirable weight gain has been the calculation of the average weights of identifiable components of normal pregnancies (Pitkin, 1975). The total prenatal weight gain is the product of a number pf physiological changes that occur during pregnancy. The composition of this weight gain is made up of fetal and maternal components. As illustrated in Figure 1, maternal weight gain accounts for approximately six kilograms while fetal weight gain accumulates to just over five kilograms for a total gain of around 11.3 kilograms or 25 pounds (Saskatchewan Department of Health, 1981).

Figure 1
Average Maternal Weight Gain During Pregnancy



Adapted from Pitkin, R.M. Obstetrics and gynecology in Nutritional Support of Medical Practice ed. C.E. Anderson, (Hagenstown, Harper and Row, 1975)

Weight Gain and Infant Birthweight. Desirable weight gain has also been estimated on the basis of observed relations between maternal weight gain

and infant birthweight. Results of many studies (Bergner and Susser, 1970; Eastman and Jackson, 1968; Higgins, 1976; Jacobson, 1975; Phillips and Johnson, 1977; Worthington, 1979; and Wynn and Wynn, 1979) have indicated that on the average, increased birthweight was directly related to greater average weight gains during pregnancy. Pitkin (1975) suggested after conducting an extensive review of the literature that the best overall reproductive performance tended to occur at average weight gains around 25 pounds (11.3 kilograms). Jacobson (1975) substantiates this recommendation when citing a number of international studies that document the average weight gain for a normal pregnancy to be 24 pounds on the average.

Range of Weight Gain. Since 25 pounds (11.3 kilograms) is only an average figure and much individual variation exists, weights between 20 and 35 pounds (9-16 kilograms) have been recommended as a practical range for for the majority of women (Canadian Paediatric Society, 1976; and Worthington, 1979). Variations in weight gain are dependant on such factors as nutritional status of the woman, tendency toward fluid retention, age, stature, build, and other factors (Worthington, 1979).

Inadequate Weight Gain. Inadequate maternal weight gain, less than one kilogram per month after the first month and a total weight gain of less than nine kilograms (20 pounds) has been associated with lowered birthweight, intrauterine growth retardation, nausea and vomitting, and fetal jeopardy (Assessment of Maternal Nutrition, 1978). Health of the mother is also a concern when the prenatal weight gain is inadequate. Lack of adequate energy supplementation during pregnancy contributes to the compromising of maternal tissues and affects the mother's capacity to breastfeed successfully.

Excessive Weight Gain. The main concern of excess weight gain in pregnancy is that it will result in the deposition of excessive fat, which can contribute to the long-term development of obesity. Pitkin (1975) suggests that efforts to limit excessive gain are desirable but the aim of such efforts should be to bring the rate of gain near normal rather than to restrict it markedly. Weight loss during pregnancy is not recommended.

Infant Birthweight

Position Statement

A birthweight over 3000 grams is recommended by Saskatchewan Health for optimal infant potential (Saskatchewan Department of Health, 1981).

Rationale

Infants born weighing less than 2500 grams at birth are considered to be low birthweight infants (World Health Organization, 1976, and Committee on Maternal Nutrition, 1970). Low birthweight has been one of the major causes of death and handicaps in infants (Bergner and Susser, 1970; Butler and Alberman, 1967; Higgins, 1976; and Wynn and Wynn, 1979). It has been related to increased incidence of stillbirth, neonatal death, poor infant development, cerebral palsy, mental retardation, and lower intelligence (Dobbing, 1968; Singer, Westphal, and Niswander, 1968; and Winick, 1970). Infants of low birthweight are found to have inadequately developed immune systems and a higher susceptibility to disease as well (Wynn and Wynn, 1979).

Related Studies

Since birthweight is often used as an indicator of the successful outcome of pregnancy, several studies have attempted to explain the variability in birthweight by investigating numerous maternal and environmental factors.

Prenatal Weight Gain. A number of studies (Bergner and Susser, 1970; Eastman and Jackson, 1968; Higgins, 1976; Jacobson, 1975; Phillips and Johnson, 1977; Pitkin, 1975 Singer, Westphal and Niswander, 1968; Worthington, 1979; and Wynn and Wynn, 1979) have documented a positive correlation between total prenatal weight gain and birthweight. Mother's prenatal weight gain has been shown to have a major influence on infant birthweight. Results illustrate that increased birthweights were directly related to greater average weight gains during pregnancy.

Mother's Age, Education Level, and Family Income Level. Low birthweight has proved to be more prevalent among younger and lower income groups (Kessner, Singer, Kalf and Schleisinger, 1973). Wynn and Wynn (1979) found that women under 20 years of age delivered more smaller babies than older women. This finding was also documented by Higgins (1976) and Phillips and Johnson (1977).

Higgins (1975) reported results of research by Bergner and Susser, and Naeye, Shah and Abbey who have studied the effects of age and socioeconomics on infant mortality. In general, they found that infants born in poverty have higher mortality rates because of lower birthweight and that age and socioeconomics were important insofar as they related to birthweight. Wynn and Wynn (1979) also found more low birthweight infants in lower income groups. Usher and McLean (1969) reported that differences among infants of different income groups were due to differences in growth in the last trimester and that lower income groups delivered smaller infants.

Education has been identified as another factor related to low birthweight. Higgins (1976) and Wynn and Wynn (1979) found that the percentage of low birthweight infants decreased as the level of the mother's education increased. Part of the effect of education on health is the result of families with more educated parents generally having higher incomes.

Thus pregnancy at too young an age is a main generator of an under-educated lower social class and this group tends to have a higher percentage of low birthweight infants. Although Phillips and Johnson (1977) found mother's age significantly related to infant birthweight, they did not find education and income to be significant factors affecting pregnancy outcome.

Prenatal Classes. Prenatal class attendance was considered as a factor related to birthweight by Thordarson and Constanzo (1976). They found that low birthweights were more frequent in the non-attending groups.

Place of Residence. Two researchers examined the effect of place of residence on infant birthweights. Wynn and Wynn (1979) found that place of residence was a significant variable that affected reproductive outcome. It was seen as one of several social and behavioral factors that affected birthweights. On the contrary, Phillips and Johnson (1977) found that place of residence was not a significant factor related to birthweight.

Parity. Higgins (1976) reported that primipara infants were lighter than multipara infants.

Summary

The variability of infant birthweights have been related to a number of factors. Many researchers have documented that mother's prenatal weight has a major influence on infant birthweight. Mother's age and education level, as well as family income level have been identified as other significant factors. Also cited were prenatal class attendance, place of residence, and parity.

CHAPTER III

METHODOLOGY

Introduction

This chapter briefly describes the research procedure and the analysis of the data presented in Chapter IV. The reader is referred to the Saskatchewan Department of Health (1983) report Infant Feeding Practices in Saskatchewan for a more detailed account of the methodology used in that major study of which this is a supplementary report.

Research Procedure

A total stratified sample of 1976 married Saskatchewan mothers with infants 0 - 12.0 months of age were surveyed. The study monitored infant feeding practices at four times during the first year of life, specifically six weeks, three months, six months, and one year by sampling the various age groups simultaneously. A mailed questionnaire was designed to collect information on infant feeding practices, some prenatal information, and infant birthweights. A copy of the questionnaire is shown in Appendix A.

Analysis of the Data

Four steps were involved in the treatment of the data: (1) coding of the questionnaires; (2) calculation of descriptive statistics to determine frequency distributions, percentages, and mean scores; (3) preliminary chi-square analysis to examine the relationships between variables; and (4) second level chi-square analysis to determine the scores of significant difference identified in step three.

Coding

The data obtained from the completed questionnaires was coded and recorded on computer disk for statistic analysis using the Statistical Analysis System (SAS) computer package at the Saskatchewan Government Systems Center.

Descriptive Statistics

The analysis of the data took place in three steps. In the first step, descriptive statistics were calculated to identify characteristics of the sample, an indication of specific prenatal practices, and infant birthweights. The SAS subprogram FREQUENCY was used to obtain frequency distributions for all questions. Means and standard deviations were calculated for infant birthweights and prenatal weight gain.

Preliminary Chi-Square Analysis

The next step of the analysis involved the use of the SAS program FREQUENCY with the CHI-SQUARE option. The chi-square analysis was used to examine the differences in some prenatal practices and infant birthweights between subgroups and to evaluate the significance of the relationship between variables.

The population was categorized into subgroups according to family income level, mother's education level, mother's age, place of residence, prenatal class attendance, parity, and previous prenatal class attendance.

With respect to income, three groups were defined. Respondents classed in the low income category had a gross family income less than $10,000. The middle category represented those with an income between $10,000 and $24,999 and those making over $25,000 were designated as the high income group. Income categories were arrived at following the examination of Statistics Canada (1980, p.15) figures on Income Distribution by Size in Canada: Preliminary Estimates. According to these 1979 statistics approximately 25% of families in Saskatchewan made less than $10,000 per year, 43% of families made between $10,000 and $25,000 per year, and 32% of families had incomes in excess of $25,000. This reference base was used to subjectively designate family incomes as low, middle or high for the study population.

Education levels were determined as completion of Grade 8 or less, some high school, Grade 12, post-secondary training, some university, a university degree, or other. Thus, seven education groups were represented in the study. Mother's age categories were designated as: less than 20 years, 20-24 years, 25-29 years, 30-34 years, and 35 years and over.

Three residence groups were considered: large city, small city, and rural. Large city referred to Regina and Saskatoon. Communities with 5,000 to 50,000 residents were designated as small city; thus included in this category were: Estevan, Lloydminster, Melfort, Melville, Moose Jaw,

North Battleford, Prince Albert, Swift Current, Weyburn, and Yorkton. Rural was any place with a population of less than 5,000. Other subgroups were dichotomized according to: prenatal class - attenders and non-attenders; parity - primiparas and multiparas.

Chi-square analysis was carried out to evaluate the significance of the relationship existing between prenatal class attendance and the following variables: family income level, mother's age, mother's education level, place of residence, previous prenatal class attendance, and parity. The significance of family income level, mother's education level, mother's age, place of residence, prenatal weight gain, and prenatal class attendance on infant birthweight was tested using chi-square analysis as well. Another cross-tabulation calculation provided for the presentation of prenatal class attendance and infant birthweight results by health region. These results are shown in tables in Appendix B.

Preliminary chi-square analysis indicated that there were 7 of 12 pairs which produced a significant difference at the $p < .01$ level of probability. A summary of these preliminary chi-square analysis is shown in Appendix C, Table 1. Examination of some of the results produced in this analysis indicated that some further refinement of the analysis was necessary if sources of significant difference of specific variables were to be identified.

Second Chi-Square Analysis

The third step in the data analysis involved regroupings as a result of the findings in the preliminary chi-square calculations and a second chi-square analysis. Regroupings were made so mother's education level, mother's age, place of residence, and infant birthweight categories were reduced to dichotomous groups.

Mothers were regrouped by education level into two groups: those with grade 12 or less and those with post-secondary education (or higher education). Mothers were also regrouped into one of two age categories: younger mothers as less than 25 years and older mothers as those who were 25 years of age or older. Place of residence groups were reduced from three to two and thus respondents were categorized as living in urban or rural Saskatchewan. Infant birthweights were also reduced to two groups: those weighing less than 3000 grams and those 3000 grams or more.

The second chi-square analysis, calculated after regrouping, produced a number of 2 x 2 contingency tables which resulted in four of five pairs retaining significant differences at the $p < .01$ level of probability and $df = 1$. A summary of secondary chi-square analysis calculations is presented in Appendix C, Table 2. Supplementary tables that display the data calculations obtained in all the second level chi-square analyses are also shown in Appendix C.

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter, the results are presented and discussed in three sections. The first section deals with the prenatal class results, while the second section presents the prenatal weight gain results, and the third section reports on infant birthweights of the sample. In each section, the recommendation or position statement is presented, then results are reported and discussed.

It should be noted that the totals quoted for different topics will vary because all questions did not apply to all respondents and in some cases data are missing. Due to the large sample size (n = 1342) it is felt that results are representative of current practices and allow for conclusions and recommendations despite the varying data totals on different topics.

Prenatal Classes

Position Statement

Prenatal classes are recognized as one way of preparing expectant mothers for childbirth.

Attendance

Only 36.4% (484 of 1330) of the sample attended prenatal classes for this pregnancy. Sixty-two percent, 765 of 1226, of the mothers who responded to a question regarding prenatal class attendance "ever" had attended prenatal classes at some time. Very few mothers, 10.1% (43 of 425) who had previously attended prenatal classes attended again for this pregnancy. Approximately one-third of the mothers (37.6%) indicated they had never attended any preparatory childbirth classes and 340 of 1226 (27.7%) of mothers reported they were first time attenders.

The majority of mothers (526 of 767 or 68.5%) who had attended prenatal classes did so between two and seven years ago. Twenty-eight percent (212 of 767) had attended within the last year and 4% had not attended prenatal classes for over seven years. Table 1 presents a summary of prenatal class attendance.

The data for prenatal class attendance by health region are shown in Appendix B, Table 1.

TABLE 1

A Summary of Prenatal Class Attendance

Prenatal Class Attendance	Number of Mothers	Percentage
This Pregnancy	484 of 1330	36.4
At Some Time	765 of 1226*	62.4
Previously	382 (31.2%)	
Previously and Now	43 (10.1%)	
First Time	340 (27.7%)	
Never	461 of 1226	37.6

* Only 1226 of the mothers responded to the question on "prenatal class attendance ever" while 1330 mothers responded to the question regarding attendance for this pregnancy.

Characteristics of Attenders

Basic demographic data including mother's age and education level, family income level, and place of residence, as well as the factors of previous attendance and parity were studied to determine if they had any effect on attendance at prenatal classes. Table 2 presents a summary of the relationship of these variables to prenatal class attendance. Five of six factors proved to be significantly related to prenatal class attendance.

TABLE 2

A Summary of Chi-Square Analysis Between Prenatal Class Attendance and Selected Variables

Variable	x^2	df	Significance*
Mother's Age	34.51	4	.0001 *
Mother's Education Level	48.97	6	.0001 *
Place of Residence	17.82	2	.0001 *
Previous Prenatal Class Attendance	135.11	1	.0001 *
Parity	438.61	1	.0001 *
Family Income Level	4.93	2	.0848 NS

* $p < .01$

Mother's Age. Mother's age was found to be significantly ($x^2 = 34.51$, $df = 4$, $p < .01$) related to prenatal class attendance. More younger mothers,

40.7% and 44.5% of those less than 20 years and those aged 20-24 years respectively attended prenatal classes as compared to proportionally decreasing percentages of older mothers (Table 3).

TABLE 3

Prenatal Class Attendance by Mother's Age

Mother's Age	Attenders	Non-Attenders	Total Number of Mothers
	number (%)	number (%)	number (%)
Less than 20 years	32 (40.7)	32 (59.3)	54 (4.1)
20-24 years	198 (44.5)	247 (55.5)	445 (33.6)
25-29 years	204 (36.4)	356 (63.6)	560 (42.3)
30-34 years	53 (24.1)	167 (75.9)	220 (16.6)
35 years and older	8 (17.4)	38 (82.6)	46 (3.4)
Total	485 (36.6)	840 (63.4)	1325(100.0)

Calculated $x^2 = 34.51$, df = 4, $p < .01$

Further chi-square analysis in which mothers were regrouped into two groups retained a significant ($x^2 = 18.81$, df = 1, $p < .01$) relationship to prenatal class attendance. More younger mothers (44.1% or 220 of 499), those less than 25 years of age, attended prenatal classes compared to 265 of 826 (32.1%) of those mothers 25 years of age or older. Results of the second level chi-square analysis are displayed in Appendix C, Table 3.

Mother's Education Level. There was a significant ($x^2 = 48.97$, df = 6, $p < .01$) relationship between mother's education level and prenatal class attendance. As presented in Table 4, the percentage of prenatal class attendance increased as the education level of the mother increased.

TABLE 4

Prenatal Class Attendance by Mother's Education Level

Education Level	Attenders	Non-Attenders	Total Number of Mothers
	number (%)	number (%)	number (%)
Grade 8 or Less	14 (25.0)	42 (75.0)	56 (4.2)
Some High School	31 (22.8)	105 (77.2)	136 (10.3)
Grade 12	164 (33.1)	331 (66.8)	495 (37.4)
Post-Secondary Training	114 (35.1)	211 (64.9)	325 (24.5)
Some University	84 (47.5)	93 (52.5)	177 (13.4)
University Degree	75 (56.4)	58 (43.6)	133 (10.1)
Other	1 (50.0)	1 (50.0)	2 (0.1)
Total	483 (36.5)	841 (63.5)	1324 (100.0)

Calculated $x^2 = 48.97$, df = 6, $p < .01$

Regrouping of mother's education level into two groups remained significantly ($x^2 = 22.08$, df = 1, $p < .01$) related to prenatal class attendance in a secondary chi-square analysis of the two variables. More mothers, 43% (274 of 637) with post-secondary education attended prenatal classes compared to 30.4%, (209 of 687) of mothers who completed grade 12 or less. This data is displayed in Appendix C, Table 4.

Place of Residence. Place of residence also proved to be significantly ($x^2 = 17.82$, df = 2, $p < .01$) related to prenatal class attendance. More mothers in larger cities (43.0%) attended prenatal classes than their counterparts in smaller cities (39.2%) or rural areas (31.0%). The percentage of attendance increased directly as the size of the place of residence increased. These results are presented in Table 5.

TABLE 5

Prenatal Class Attendance by Place of Residence

Place of Residence	Attenders	Non-Attenders	Total Number of Mothers
	number (%)	number (%)	number (%)
Large City (Regina or Saskatoon)	203 (43.0)	269 (57.0)	472 (35.5)
Small City (5,000 - 50,000)	83 (39.2)	129 (60.9)	212 (15.9)
Rural (Less than 5,000)	200 (31.0)	446 (69.0)	646 (48.6)
Total	486 (36.5)	844 (63.5)	1330(100.0)

Calculated $x^2 = 17.82$, df = 2, $p < .01$

These two variables were also significantly ($x^2 = 16.41$, df = 1, $p < .01$) related when place of residence was dichotomized as either urban or rural. More mothers in cities, 286 of 684 (41.8%), attended classes than those in rural Saskatchewan where 200 of 646 (31.0%) attended classes. Table 5 in Appendix C presents these results.

Previous Prenatal Class Attendance. A significant ($x^2 = 135.11$, df = 1, $p < .01$) relationship was established between prenatal class attendance for this pregnancy and previous attendance as well. Very few mothers, 43 of 425 (10.1%), who attended prenatal classes previously attended again for this pregnancy (Table 6).

TABLE 6

Prenatal Class Attendance and Previous Attendance

Previous Attendance	Attenders	Non-Attenders	Total Number of Mothers
	number (%)	number (%)	number (%)
Yes	43 (10.1)	382 (89.9)	425 (34.7)
No	340 (42.5)	461*(57.5)	801 (65.3)
Total	383 (31.2)	843 (68.8)	**1226(100.0)

Calculated $x^2 = 135.11$, df = 1, $p < .01$

* This figure represents the number of mothers who have never attended prenatal classes (461 of 1226 or 37.6% of the sample).

** 116 mothers did not respond to the question regarding "prenatal class attendance ever."

Parity. Parity was the final factor that proved to be significantly ($x^2 = 438.61$, df = 1, $p < .01$) related to prenatal class attendance. Seventy-five percent (340 of 456) of mothers expecting their first child, primiparas, attended prenatal classes while only 16.3% (142 of 870) mothers who had other children, multiparas, attended classes for this pregnancy. Table 7 presents these results.

TABLE 7

Prenatal Class Attendance by Parity

Parity	Attenders	Non-Attenders	Total Number of Mothers
	number (%)	number (%)	number (%)
Primiparas	340 (74.6)	116 (25.4)	456 (34.4)
Multiparas	142 (16.3)	728 (83.7)	870 (65.6)
Total	482 (36.4)	844 (63.3)	1326(100.0)

Calculated $x^2 = 438.61$, df = 1, $p < .01$

Non-Significant Factors. Family income was not significantly ($x^2 = 4.93$, df = 2, p = .08) related to prenatal class attendance.

Location of Prenatal Classes

Of those mothers attending prenatal classes for this pregnancy, most (76.0%) of them attended classes at public health offices. Fourteen percent indicated they attended classes at other places such as the library or community colleges while 10.0% reported hospitals as the location at which classes they attended were held (Table 8).

TABLE 8

Location of Prenatal Classes

Location of Classes	Number of Mothers	Percentage
Public Health Office	364	76.0
Other	67	14.0
Hospital	48	10.0
Total	479*	100.0

* 7 mothers did not indicate where they attended classes.

Infant Nutrition Information

Infant nutrition information was included in most (77.0%) of the prenatal classes. This information was presented most frequently (54.3% of the time) by a nurse. Table 9 shows other persons who presented information on infant nutrition. Infant nutrition information was not included in 7.2% of the classes.

TABLE 9

Infant Nutrition Information at Prenatal Classes

Presenter	Number of Times Presented	Percentage
Nurse	257	54.3
Nurse and Nutritionist or Dietitian	42	8.9
Nutritionist or Dietitian	36	7.6
Other	29	6.1
Didn't Attend	50	10.6
Not Included	34	7.2
Don't Remember	25	5.3
Total	473	100.0

Summary

Table 10 presents a summary of the prenatal class information.

TABLE 10

A Summary of Prenatal Class Information

Attendance

This Pregnancy	36.4%
First Time Attenders	27.7%
At Some Time	62.4%
Previous and Now	10.1%
Never Attenders	37.6%

Percentage of Attenders by Characteristics

Education	Grade 8 or Less 25.0%	Some High School 22.8%	Grade 12 33.1%	Post-Sec. Training 35.1%	Some Univ. 47.5%	Univ. Degree 56.4%	Other 50.0%

Mom's Age	Less than 20 yrs 40.7%	20-24 yrs 44.5%	25-29 yrs 36.4%	30-35 yrs 24.1%	35 yrs or more 17.4%

Income Level	Low 28.4%	Middle 36.6%	High 40.5%

Place of Residence	Rural 31.0%	Urban 42%	Small City	39.2%
			Regina or Saskatoon	43.0%

Parity	Primiparas 74.6%	Multiparas 16.3%

Location of Prenatal Classes

Public Health Office 76.0%	Other 14.0%	Hospital 10.0%

Infant Nutrition Information Presented

Nurse 54.3%	Nurse Nutr./Diet. 8.9%	Nutr. or Diet. 7.6%	Other 6.1%	Not Included 7.2%	Don't Remember or Didn't Attend 15.9%

Discussion

Expectant parents need information and education. Prenatal classes seem to be providing some parents with this necessary service as approximately one-third of the mothers sampled attended classes for this pregnancy. It is interesting to note that the majority of attenders were expecting their first child and that very few mothers attended prenatal classes as preparation for subsequent children. While 62% of the mothers indicated they had attended classes at some time, most attended two to seven years previous to the birth of this infant. These results seem to indicate that many women are relying on their initial prenatal instruction that was received a number of years ago. This suggests that prenatal classes are seen as only necessary once and do not reach parents expecting subsequent children with new information or current recommended practices.

Some of the results on factors related to prenatal classes are contrary to those reported by previous researchers. Both Thordarson and Costanzo (1976) and Davis and Morrone (1962) found older mothers and those with higher income levels more frequent attenders at prenatal classes. In contrast, results of this study indicate that more younger than older mothers in Saskatchewan are attending prenatal classes and that family income does not have any significant effect on attendance.

The results, however, do support previous findings regarding mother's education level. As reported in other studies, the percentage of attendance increased directly as the education level of the mother increased.

Place of residence and parity also proved to be significant factors related to attendance in this study. First time mothers, primiparas, and those living in larger centers are more likely to attend classes than mothers who have other children and those living in smaller cities or rural areas of Saskatchewan. These factors were not investigated in previous studies reviewed.

Public health offices were identified as the primary location where prenatal classes were attended. Hospitals and libraries were cited by approximately 25% of the mothers as location of prenatal classes. Although no qualifying data was collected, it appears that the public health office is seen by a number of mothers as the agency that provides prenatal instruction.

The data confirmed that the majority of prenatal classes provide information on infant nutrition, however data related to the context or extensiveness of that information was not collected. It is evident that a more comprehensive study on

the availability and effectiveness of prenatal classes is necessary to provide conclusions on current programs and recommendations for improvement of this service delivery.

Prenatal Weight Gain

Position Statement

Saskatchewan Health recommends a weight gain between 20 and 35 pounds (9-16 kilograms) as a practical range for the majority of women during pregnancy (Saskatchewan Department of Health, 1981).

Results

The average weight gain of the mothers in the study group was 28½ pounds. Sixty percent (796 of 1318) of the women gained between 20 and 35 pounds, 12.9% (170 of 1318) of the mothers gained less than the recommended weight and 26.7% (352 of 1318 mothers) gained more than 35 pounds during their pregnancy. Table 11 shows the various prenatal weight gains of the study group.

TABLE 11

Summary of Mother's Prenatal Weight Gain

Weight Gain (in pounds)	Number of Mothers	Percentage
Less than 20 lbs	170	12.9
20-24 lbs	254	19.3
25-29 lbs	272	20.6
30-34 lbs	270	20.5
35-39 lbs	140	10.6
40 lbs and over	212	16.1
Total	1318*	100.0

* 24 women did not respond to this question

Discussion

The results of this study indicating that the average prenatal weight gain of Saskatchewan women is 28½ pounds substantiates previous findings of a number of international studies cited by Jacobson (1975). The majority of the sample (60.4%) had weight gains within the recommended range, between 20 and 35 pounds (9-16 kilograms). The remaining 39.6% of pregnant mothers who

gained either below or above the suggested range present a challenge for health professionals.

A number of mothers still need to be encouraged to increase their weight gain as it appears that approximately 13% of Saskatchewan women are not gaining enough weight to adequately support the growth and development of the fetus, as well as maintain their own health in preparation for lactation.

Perhaps of greater concern, though, is the large number of women (26.7%) who are gaining in excess of 35 pounds during pregnancy. It is considered normal during pregnancy that a store of maternal fat be deposited as a caloric reserve to be used if a pregnant women encounters an episode of unexpected dietary restriction and to subsidize the energy costs of subsequent lactation (Worthington, 1979). However, it seems that a substantial percentage of Saskatchewan women are gaining more weight than necessary during pregnancy. These excess weight gains will result in the deposition of excessive fat, which will contribute to the long term development of obesity. The results of the present study suggest the need for a closer monitoring of prenatal weight gains as a substantial portion (40%) of the population of pregnant women in Saskatchewan are not producing desirable weight gains.

Infant Birthweights

Position Statement

A birthweight over 3000 grams is recommended by Saskatchewan Health for optimal infant potential (Saskatchewan Department of Health, 1981).

Results

Forty-eight of 1342 infants (3.6%) in the study sample weighed less than 2500 grams at birth and 185 infants (13.8%) weighed between 2500 and 2999 grams. The remaining 82.6% (1109 of 1342) of the infants had an optimal birthweight of 3000 grams or more. The average infant birthweight was 3451 grams. Table 12 presents these results. The data for infant birthweights by health region are shown in Appendix B, Table 2.

TABLE 12

Infant Birthweights

Birthweight	Number of Infants	Percentage
Less than 2500 gm	48	3.6
2500 - 2999 gm	185	13.8
3000 gm or more	1109	82.6
Total	1342	100.0

Birthweight Factors

Family income level, mother's age, mother's education level, place of residence, prenatal class attendance, and prenatal weight gain were examined to determine if they had any effect on infant birthweight. Two of the six factors proved to be significant (Table 13).

TABLE 13

A Summary of Chi-Square Analysis Between Infant Birthweights and Selected Variables

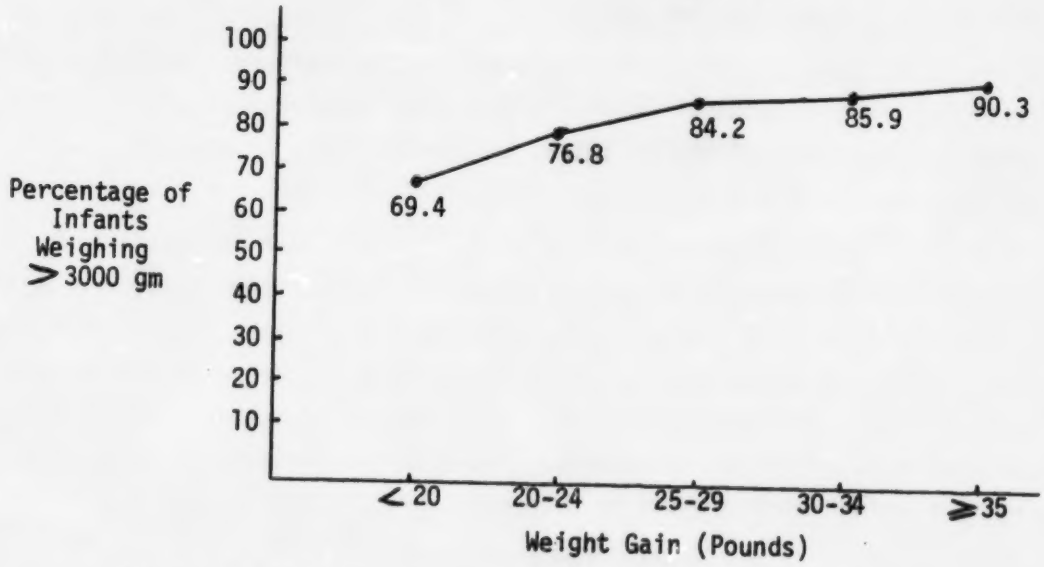
Variable	x^2	df	Significance*	
Family Income Level	4.25	4	.3735	NS
Mother's Age	4.90	8	.7679	NS
Mother's Education Level	19.19	12	.0840	**
Place of Residence	15.35	4	.0040	*
Prenatal Class Attendance	3.63	2	.1631	NS
Prenatal Weight Gain	49.88	8	.0001	*

* $p < .01$
** Table was so sparse that chi-square may not be a valid test.

Prenatal Weight Gain. There was a positive and significant relationship ($x^2 = 49.88$, $df = 8$, $p < .01$) between prenatal weight gain and infant birthweight. As seen in Figure 2, the incidence of optimal birthweight increased directly as prenatal weight gain increased.

Further chi-square analysis with both birthweight and weight gain variables reduced to dichotomous groups continued to be significantly related ($x^2 = 23.75$, $df = 1$, $p < .01$). A higher percentage, 30.5% (52 of 170), of mothers who gained less than 20 pounds delivered infants whose birthweight was less than 3000 grams compared with 15.2% (174 of 1148) of mothers who gained 20 pounds or more. These data are presented in Appendix C, Table 6.

Figure 2
Infant Birthweight as a Function of Prenatal Weight Gain



Place of Residence. A second factor, place of residence, proved to be significantly (x^2 = 15.35, df = 4, $p < .01$) related to infant birthweight in this study.

Mothers in small cities (5.1%) had more low birthweight infants than their counterparts in either large cities (1.9%) or rural areas (4.3%) in Saskatchewan. Twenty-five percent of infants born in small cities weighed less than 3000 grams at birth whereas only 16% of infants born in Regina and Saskatoon or rural areas had birthweights below the recommended standard. These data are presented in Table 14.

TABLE 14
Infant Birthweights by Place of Residence

Birthweight	Place of Residence			Total
	Large City	Small City	Rural	
	number (%)	number (%)	number (%)	number (%)
Less than 2500 gm	9 (1.9)	11 (5.1)	28 (4.3)	48 (3.6)
2500 - 2999 gm	67 (14.1)	42 (19.6)	76 (11.6)	185 (13.8)
3000 gm or more	399 (84.0)	161 (75.2)	549 (84.1)	1109 (82.6)
Total	475 (35.4)	214 (15.9)	653 (48.7)	1342(100.0)

Calculated x^2 = 15.35, df = 4, $p < .01$

Further chi-square analysis which involved regrouping mothers into urban and rural place of residence categories did not retain a significant difference between the two groups.

Non-Significant Factors. Other factors examined, family income level, prenatal class attendance, mother's age and education level, did not prove to have a significant effect on infant birthweights.

Discussion

In 1977 approximately 5.7% of the infants born in Saskatchewan weighed less than 2500 grams. Twenty-one percent of infants were delivered weighing less than 3000 grams (Saskatchewan Department of Health, 1977). Thus the results of this study seem to indicate that the incidence of low birthweight has decreased in Saskatchewan and the percentage of mothers having infants of optimal birthweight has increased. Table 15 illustrates the comparison between infant birthweights in 1977 and 1980.

TABLE 15

Infant Birthweights: A Comparison Between 1977 and 1980

Birthweight	1977*	1980
Less than 2500 gm	5.7%	3.6%
Between 2500 - 2999 gm	15.4%	13.8%
More than 3000 gm	78.8%	82.6%

* Source: Annual Report on Saskatchewan, Vital Statistics, Regina, 1977

It is important that the differences in the study population and the 1977 population be considered in comparing the results. The 1977 data refers to the total Saskatchewan population whereas the 1980 study results are based on data received from married mothers only. Illegitimate and adopted births were not included in the present study which may account for the perceived decrease in the incidence of low birthweights.

Although a number of factors have been related to low birthweight in previous studies, only two, prenatal weight gain and place of residence, proved to be significant in the present study.

Progressive increase in prenatal weight gain was paralleled by a progressive increase in the percentage of optimal birthweight infants and a progressive decline in the incidence of low birthweight infants. These results support the findings of numerous other studies.

It is interesting to find that 25% of infants born in small towns in Saskatchewan weigh less than 3000 grams. This is 9% more than the percentage in either of the larger cities, Regina and Saskatoon, or rural areas. Perhaps this suggests a need for closer monitoring and/or instruction of women in small cities during the prenatal period.

Contrary to previous studies, mother's age, education level, family income level, and prenatal class attendance were not significant factors related to infant birthweight. Thus no special groups except mothers in small cities were identified as a target group for health promotion efforts.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

Summary

Prenatal Classes

Approximately one-third (36.4%) of the study sample attended prenatal classes for this pregnancy and the majority of them were first time attenders. Very few mothers (10.1%) attended prenatal classes more than once and a substantial percentage of mothers (37.6%) had never attended prenatal classes.

More younger mothers and those with high levels of education attended prenatal classes. Place of residence and parity also influenced attendance. A larger percentage of mothers who lived in larger communities or cities and those who were expecting their first child attended prenatal classes than their counterparts. Family income level did not affect attendance.

Prenatal classes were attended most frequently (76% of the time) at Public Health Offices while some mothers obtained instruction at the library, hospital, or other locations. The majority of the classes (77.0%) provided information on infant nutrition which was usually presented by a nurse, nutritionist, or dietitian.

Prenatal Weight Gain

The average weight gain of mothers in the study group was 28½ pounds. The majority (60.4%) of mothers had weight gains within the recommended range, between 20 and 35 pounds. The remaining 39.6% of pregnant women gained either less or more than the recommended weight: 12.9% gained less than 20 pounds and 26.7% gained in excess of 35 pounds during pregnancy.

Infant Birthweights

The average infant birthweight in the study population was 3451 grams. Forty-eight infants (3.6%) weighed less than 2500 grams at birth and 13.8% weighed between 2500 and 2999 grams. The remaining 82.6% of the infants had an optimal birthweight of 3000 grams or more. These results indicate a decrease in the incidence of low birthweight and an increase in the percentage of optimal birthweight.

Prenatal weight gain proved to be significantly and positively related to infant birthweight. Progressive increase in prenatal weight gain was paralleled by a progressive increase in the percentage of optimal birthweight infants and a progressive decline in the incidence of low birthweight infants. Mothers in small cities were identified as a special target group for health promotion efforts regarding infant birthweight. Twenty-five percent of infants born in small cities in Saskatchewan had birthweights less than 3000 grams. Other factors examined including family income, prenatal class attendance, mother's age and education level, did not have a significant effect on infant birthweights.

Recommendations

Study findings lead to the following recommendations:

Prenatal Classes

1. That a comprehensive study be conducted on the availability of, attendance at, perceived importance of, components and effectiveness of prenatal classes to provide conclusions on current programs and subsequent recommendations for improvements of this service delivery.
2. That mothers as well as health professionals and agencies be made aware of sources of prenatal information, that is, the availability of prenatal classes and the prenatal resource material recently produced by Saskatchewan Health, Health Promotion.

Prenatal Weight Gain

3. That mothers not only be encouraged to gain an appropriate weight during pregnancy, between 20 and 35 pounds (9-16 kilograms), but that they be instructed or informed of the reasons for this desired weight gain.
4. That health promotion efforts on prenatal weight gain be initiated to encourage desirable weight gains during pregnancy. This seems to be a high priority need as indicated by the study results which identified approximately 40% of Saskatchewan mothers are gaining undesirable weights during pregnancy.

Infant Birthweights

5. That health professionals be made aware of the large percentage of infants in small Saskatchewan cities that are born weighing less than 3000 grams.

6. That mothers in small cities in Saskatchewan be recognized as a special target group for health promotion efforts on prenatal instruction and infant birthweights.
7. That birthweights of infants in small Saskatchewan cities be monitored more closely and that women be encouraged to gain appropriate prenatal weights in an attempt to reduce the large percentage of infants born with less than optimal birthweights.
8. That health education programs emphasize the relationship between prenatal variables and their affect on birthweights.

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APPENDIX A*

INFANT FEEDING QUESTIONNAIRE

* The specific questionnaire items which provided the data for this report are indicated with an asterisk (*).

INFANT FEEDING SURVEY

FOR OFFICE USE ONLY

WHEN ANSWERING THE QUESTIONS, UNLESS OTHERWISE INDICATED, PLEASE CIRCLE ONE NUMBER FOR YOUR ANSWER.

For example: This month is:

1. OCTOBER
2. NOVEMBER
3. DECEMBER

1 2 3

4 5 6 7

PLEASE ANSWER THE QUESTIONS ABOUT YOUR YOUNGEST CHILD.

---

1. How old is your baby? _____

8 9

2. Is your baby a:

   1. BOY
   2. GIRL

10

3. What was your baby's birthweight? _____

11 12 13 14

4. How much does your baby weigh NOW? _____

15 16 17 18

5. How much weight did you gain during THIS pregnancy? _____

6. a) Did you attend a prenatal class during THIS pregnancy?

19 20

   1. YES
   2. NO (IF NO, GO TO QUESTION 7)

21

   b) IF YES, who held the classes?

   1. PUBLIC HEALTH OFFICE
   2. HOSPITAL
   3. OTHER (please explain) _____
   4. DON'T KNOW

22

   c) IF YES, did any of the classes include information on feeding your baby?

   1. YES, GIVEN BY A NURSE
   2. YES, GIVEN BY A NUTRITIONIST/DIETITIAN
   3. YES, GIVEN BY A NURSE AND A NUTRITIONIST/DIETITIAN
   4. YES, GIVEN BY SOMEONE ELSE (please explain) _____
   5. YES. BUT I DID NOT ATTEND THAT CLASS
   6. NO, IT WAS NOT INCLUDED
   7. DON'T REMEMBER

23 24 25 26

7. a) Have you ever attended prenatal classes?

   1. NO
   2. YES

27

   b) IF YES, how long ago? _____

28 29

(OVER)

8. a) How long was your baby allowed to stay with you during the first few days after birth?

1. ALL DAY AND ALL NIGHT
2. ALL DAY AND NIGHT FEEDING
3. AT FEEDING TIMES ONLY
4. AT FEEDING TIMES PLUS EXTRA TIME WITH YOU
5. OTHER (please explain) _____

30

b) Who made the decision that your baby could stay with you?

1. NURSE
2. YOU
3. NURSE AND YOU
4. OTHER (please explain) _____

31

9. Which of the following kinds of milk have you given your baby THIS WEEK? (please indicate with a check (√) in the first column the MAIN kind of milk and in the second column any OTHER kind of milk which may have been given)

MAIN	OTHER	KIND OF MILK	
		BREASTMILK	32 33 34
		COMMERCIAL FORMULA (for example: ENFALAC, SIMILAC, SMA, etc.)	
		HOME PREPARED EVAPORATED MILK FORMULA	35 36 37
		HOME PREPARED WHOLE MILK FORMULA	
		HOME PREPARED GOAT MILK FORMULA	38 39 40
		PLAIN WHOLE MILK	
		PLAIN 2% MILK	41 42 43
		PLAIN SKIM MILK	
		PLAIN GOAT MILK	
		OTHER (please explain) _____	

10. a) Did you ever breastfeed this baby?

1. NO (IF NO, GO TO QUESTION 11)
2. YES

44

b) Are you breastfeeding this baby now?

1. YES (IF YES, GO TO QUESTION 11)
2. NO

45

10. c) How old was this baby when you stopped breastfeeding?

_____ 46 47

d) Why did you stop breastfeeding? _____ 48 49

_____ 50 51

_____ 52 53

11. a) How many other children do you have? _____ 54 55

b) Did you breastfeed any of your other children?

1. YES (how many?) _____
2. NO (how many?) _____ 56 57 58
3. NO, THIS IS MY FIRST CHILD 59 60 61

12. Are you giving your baby any vitamin or mineral drops?

1. YES
2. NO (IF NO, GO TO QUESTION 14) 62 63

64

13. Which of the following have you given your baby THIS WEEK? (please indicate with a check (✓) which you have given and how often for each)

TYPE	MORE THAN ONCE A DAY	ONCE A DAY	3-5 TIMES A WEEK	ONCE A WEEK	LESS THAN ONCE A WEEK	DON'T KNOW
FLOORIDE DROPS						
IRON DROPS						
TRI-VI-SOL						
TRI-VI-FLOR						
POLY-VI-SOL						
POLY-VI-FLOR						
OSTOCO						
OTHER (indicate what kind)						

65 66 67

68 69 70

71 72 73

14. Are you giving your baby any food or drink other than milk? THIS DOES NOT INCLUDE WATER.

1. NO (IF NO, GO TO QUESTION 22)
2. YES 74

(OVER)

-4-

15. How OLD was your baby when you first gave any food or drink other than milk? THIS DOES NOT INCLUDE WATER. _____ 75 76

16. What were the first TWO NON-MILK foods or drinks offered? THIS DOES NOT INCLUDE WATER.

1st _____ 77 78

2nd _____ 79 80

17. Which of the following foods did you feed your baby THIS WEEK? (please indicate with a check (✓) the food(s) given and how often each was given)

TYPE OF FOOD	THREE TIMES A DAY	TWICE A DAY	ONCE A DAY	3-5 TIMES A WEEK	LESS THAN ONCE A WEEK	DON'T KNOW	
INFANT CEREAL							1 / 8 9
OTHER CEREAL (indicate what kind)							2 / 10 11
VEGETABLES							3 / 12 13
FRUIT JUICES							
FRUIT							4 / 14 15
MEAT OR FISH							
DAIRY PRODUCTS							5 / 16 17
EGGS							6 / 18 19
OTHER (please explain)							7 / 20 21

18. Not including cereals, which of the following BEST describes the type of food you feed your baby? 8 / 22 23

1. ONLY STORE BOUGHT BABY FOOD
2. ONLY HOME MADE BABY FOOD
3. MAINLY STORE BOUGHT BABY FOOD
4. MAINLY HOME MADE BABY FOOD

9 / 24 25

26

19. Do you add salt to the food you give your baby?

1. NO
2. YES (please explain to which foods) _____

_____ 27 28 29

-5-

20. Do you add sugar to the foods or drinks you give your baby?

    1. NO
    2. YES (please explain to which foods) _____

    _____

30 31 32

21. Who helped you most to decide when to start giving your baby solid food?

    1. DOCTOR
    2. BABY
    3. PUBLIC HEALTH NURSE
    4. NUTRITIONIST/DIETITIAN
    5. FAMILY OR FRIENDS
    6. MEDIA (TELEVISION, RADIO, NEWSPAPER)
    7. BOOKS, MAGAZINES, PAMPHLETS
    8. OTHER (please explain) _____

33 34

35 36

37 38

22. Did you receive the pamphlet on infant nutrition produced by Saskatchewan Health "Caring is ... the right food at the right time"?

    1. YES
    2. NO (IF NO, GO TO QUESTION 26)

39

23. Did you find the information in the pamphlet "Caring is ... the right food at the right time" helpful?

    1. YES, VERY HELPFUL
    2. YES, SOMEWHAT HELPFUL
    3. NO, NOT TOO HELPFUL
    4. DID NOT READ THE PAMPHLET
    5. OTHER (please explain) _____

40

24. Who did you receive the pamphlet from?

    1. DOCTOR
    2. PUBLIC HEALTH NURSE
    3. NUTRITIONIST/DIETITIAN
    4. HOSPITAL
    5. OTHER (please explain) _____

41

25. Do you have any other comments about the pamphlet "Caring is ... the right food at the right time"?

    _____

    _____

42 43

26. How old are you? _____

44 45

27. Where do you live?

    1. IN A LARGE CITY (REGINA OR SASKATOON)
    2. IN A SMALL CITY (5,000 to 30,000 people)
    3. IN A TOWN OR VILLAGE (less than 5,000 people)
    4. IN A RURAL AREA (country)

46

(OVER)

28. Which of the following is the HIGHEST level of education that you have completed?

1. GRADE 6
2. GRADE 8
3. GRADE 12
4. TECHNICAL SCHOOL
5. SOME UNIVERSITY
6. UNIVERSITY DEGREE
7. DID NOT ATTEND SCHOOL
8. OTHER (please explain) _____

47

29. Which of the following BEST describes your annual family income (before taxes)?

1. UNDER $5,000
2. $5,000 - $9,999
3. $10,000 - $14,999
4. $15,000 - $19,999
5. $20,000 - $24,999
6. $25,000 - $29,999
7. $30,000 - $34,999
8. $35,000 AND OVER
9. DON'T KNOW

48 49

30. If you think there is something important about the feeding of your baby that was not asked, please tell us what it is:

_____

_____

_____

50 51

31. Is there something about infant feeding you would like to know?

_____

_____

_____

52 53

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. PLEASE RETURN IT TO:

LYNN HARASYM, PROVINCIAL NUTRITIONIST
SASKATCHEWAN HEALTH
HEALTH PROMOTION DIVISION
3475 ALBERT STREET
REGINA, SASKATCHEWAN
S4S 6X6

APPENDIX B

DATA BY HEALTH REGION

TABLE 1B*

Prenatal Class Attendance by Health Region

Health Region	Number of Responses	Attendance	Non-Attendance
		number (%)	number (%)
DNS	9	5 (55.6)	4 (44.4)
Saskatoon	201	90 (44.8)	111 (55.2
Regina	211	90 (42.7)	121 (57.3)
Moose Jaw	77	30 (39.0)	47 (61.0)
Yorkton/Melville	56	21 (37.5)	35 (62.5)
Melfort/Tisdale	84	30 (35.7)	54 (64.3)
Weyburn/Estevan	38	13 (34.2)	25 (65.8)
North Battleford	56	19 (33.9)	37 (66.1)
Prince Albert	72	22 (30.6)	50 (69.4)
Regina Rural	60	15 (25.0)	45 (75.0)
Rosetown	52	13 (25.0)	39 (75.0)
Saskatoon Rural	45	11 (24.4)	34 (75.6)
Swift Current	54	12 (22.2)	42 (77.8)
Total	1015	371 (36.6)	644 (63.4)

* Results of this table are based on 75.6% of the study sample

** Listed by decreasing percentage of attendance

TABLE 2B*

Infant Birthweight by Health Region

Health Region**	Low Birthweight 2500 gm	2500-2999 gm	3000 gm	Total
	number (%)	number (%)	number (%)	number
DNS	1 (11.1)	1 (11.1)	7 (77.8)	9
Saskatoon Rural	4 (8.5)	5 (10.6)	38 (80.8)	47
Weyburn/Estevan	3 (7.9)	7 (18.4)	28 (73.7)	38
Moose Jaw	5 (6.4)	12 (15.4)	61 (78.2)	78
Melfort/Tisdale	5 (6.0)	12 (14.3)	67 (79.8)	84
Yorkton/Melville	3 (5.3)	12 (21.0)	42 (73.7)	57
Rosetown	2 (3.8)	4 (7.7)	46 (88.5)	52
Swift Current	2 (3.7)	8 (14.8)	44 (81.5)	54
North Battleford	2 (3.5)	9 (15.8)	46 (80.7)	57
Regina Rural	3 (3.3)	10 (16.4)	49 (80.3)	61
Saskatoon	6 (2.9)	19 (9.3)	179 (87.8)	204
Prince Albert	2 (2.8)	6 (8.3)	64 (88.9)	72
Regina	3 (1.4)	35 (16.6)	173 (82.0)	211
Total	40 (3.9)	140 (13.7)	844 (82.4)	1024

* Health Regions could only be identified on 1024 of the questionnaires, therefore these results are based on 76.3% of the study sample.

** Listed by decreasing percentage of low birthweight.

APPENDIX C

SUPPLEMENTARY TABLES

TABLE 1C

Summary of Preliminary Chi-Square Analyses

Variables	x^2	df	Significance*	
Prenatal Class Attendance				
Family Income Level	4.93	2	.0848	NS
Mother's Age	34.51	4	.0001	*
Mother's Education Level	48.97	6	.0001	*
Place of Residence	17.82	2	.0001	*
Parity	438.61	1	.0001	*
Previous Attendance	135.11	1	.0001	*
Infant Birthweight				
Family Income Level	4.25	4	.3735	NS
Mother's Age	4.90	8	.7679	NS
Mother's Education Level				NS
Place of Residence	15.35	4	.0040	*
Prenatal Class Attendance	3.63	2	.1631	NS
Prenatal Weight Gain	49.88	8	.0001	*

* $p < .01$

TABLE 2C

Summary of Secondary Chi-Square Analyses

Variables	x^2	df	Significance*	Table
Prenatal Class Attendance				
Mother's Age	18.81	1	.01	3C
Mother's Education Level	20.08	1	.01	4C
Place of Residence	16.41	1	.01	5C
Infant Birthweight				
Prenatal Weight Gain	23.75	1	.01	6C
Place of Residence	1.64	1	NS	--

* $p < .01$

TABLE 3C*

Prenatal Class Attendance by Mother's Age

Mother's Age	Prenatal Class Attendance	Prenatal Class Non-Attendance	Total Number of Mothers
	number (%)	number (%)	number (%)
Younger (less than 25 years)	220 (44.1)	279 (65.9)	499 (37.5)
Older (25 years and older)	265 (32.1)	561 (67.9)	826 (62.5)
Total	485 (36.6)	840 (63.4)	1325(100.0)

Calculated x^2 = 18.81, df = 1, $p < .01$

* This table is supplementary to Table 3 in the text which presents the more detailed data analysis of prenatal class attendance by mother's age.

TABLE 4C

Prenatal Class Attendance by Mother's Education Level

Education Level	Prenatal Class Attendance	Prenatal Class Non-Attendance	Total Number of Mothers
	number (%)	number (%)	number (%)
Grade 12 or less	209 (30.4)	478 (69.6)	687 (51.9)
Post-Secondary Education	274 (43.0)	363 (57.0)	637 (48.1)
Total	483 (36.5)	841 (63.5)	1324(100.0)

Calculated x^2 = 50.08, df = 1, p .01

* This table is supplementary to Table 4 in the text which presents the more detailed analysis of prenatal class attendance by mother's education level.

TABLE 5C*

Prenatal Class Attendance by Place of Residence

Place of Residence	Prenatal Class Attendance	Prenatal Class Non-Attendance	Total Number of Mothers
	number (%)	number (%)	number (%)
Urban (5,000 or more)	286 (41.8)	398 (58.2)	684 (51.4)
Rural (Less than 5,000)	200 (31.0)	446 (69.0)	646 (48.6)
Total	486 (36.5)	844 (63.5)	1330(100.0)

Calculated $x^2 = 16.41$, df = 1, $p < .01$

* This table is supplementary to Table 5 in the text which presents the more detailed data analysis of prenatal class attendance by place of residence.

TABLE 6C*

Infant Birthweight as a Function of Prenatal Weight Gain

Infant Birthweight	Mother's Weight Gain < 20 lbs	Mother's Weight Gain ≥ 20 lbs	Total Number of Mothers
	number (%)	number (%)	number (%)
$<$ 3000 gm	52 (30.5)	174 (15.2)	226 (17.1)
$\geq$ 3000 gm	118 (69.4)	974 (84.8)	1092 (82.9)
Total	170 (12.9)	1148 (87.1)	1318(100.0)

Calculated $x^2 = 23.75$, df = 1, $p < .01$

* This table is supplementary to Figure 2 in the text that presents the detailed analysis of the relationship between prenatal weight gain and infant birthweight.